

SWIM Connect 2015

*SWIM Partnerships:
Collaboration with the
FAA's Decision Support
Service (DSS) Programs*

3:00 PM

By: Rebecca Guy
AJM-22 PMO, Decision Support Program Manager

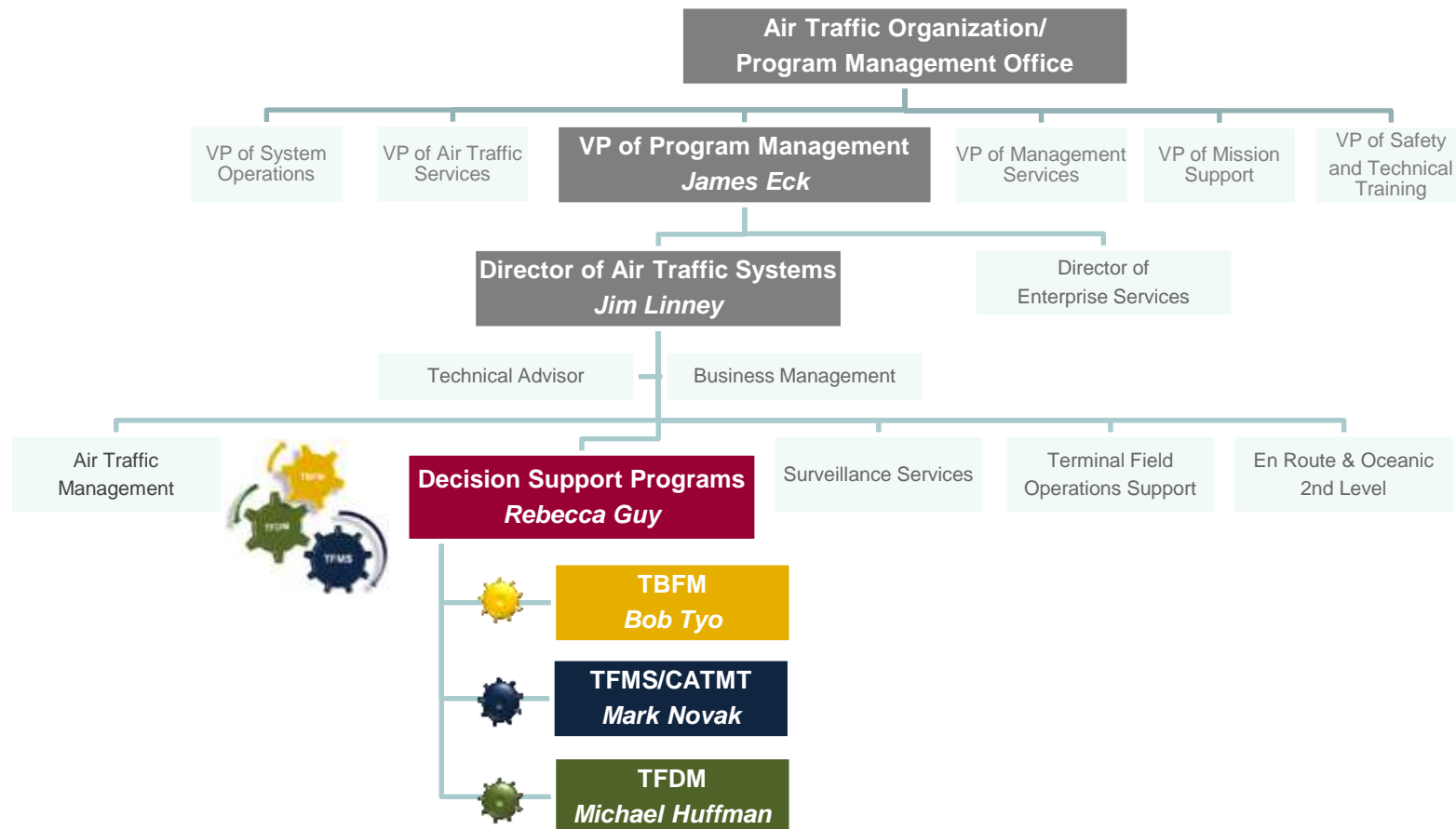
Date: November 3, 2015



Federal Aviation
Administration

The SWIM connect 2015 logo is positioned within a large white circle on the right side of the slide. The word "SWIM" is in a large, bold, black sans-serif font. To its right are three blue circles of varying sizes. Below "SWIM", the words "connect 2015" are written in a smaller, black, lowercase sans-serif font. The background of the slide is a solid blue color with abstract, overlapping light blue circular shapes at the bottom.

DSS: Who are we?



DSS Mission: Traffic Flow Management (TFM)

NextGen is an ongoing transformation of the NAS.

- Incremental implementation of new technologies and procedures is vital to meeting future growth of aviation.

DSS facilitates NextGen vision through TFM: TFDM, TBFM and TFMS

- Ensures efficient flow of traffic and maximizes system throughput across the NAS
- Improves the quality of service to NAS users by accommodating user preferences
- Improves common situational awareness by real-time information sharing



DSS Vision: Enabling NextGen

➤ Enable NextGen technologies in TFM operations

- Performance Based Navigation (PBN) –use of RNAV/RNP and Optimized Profile Descent (OPD) technologies in TBFM
- System Wide Information Management (SWIM) – TFM data exchange with external systems through SWIM
- System-wide solutions that are able to be tailored for individual aircraft –
 - Surface
 - Routes- Utilizing user preferences

➤ Provide integrated, responsive and collaborative TFM solutions that maximize efficiency and reduce delay.

- ✓ **INTEGRATED:** Strategic and tactical TFM strategies are modeled and implemented as a single cohesive strategy.
- ✓ **RESPONSIVE:** Faster more effective responses to evolving conditions in the NAS.
- ✓ **COLLABORATIVE:** Data sharing among stakeholders facilitates solutions that impose no more controls on flights than needed, allowing flight operators to fly their preferred routes at preferred times.

DSS Components: 3Ts are the engines of DSS



Time-Based Flow Management (TBFM)

Decision support system for metering based on time to optimize the flow of aircraft.

Terminal Flight Data Management (TFDM)

A new decision support system for airport surface management and ATC tower functions.

Traffic Flow Management System (TFMS)

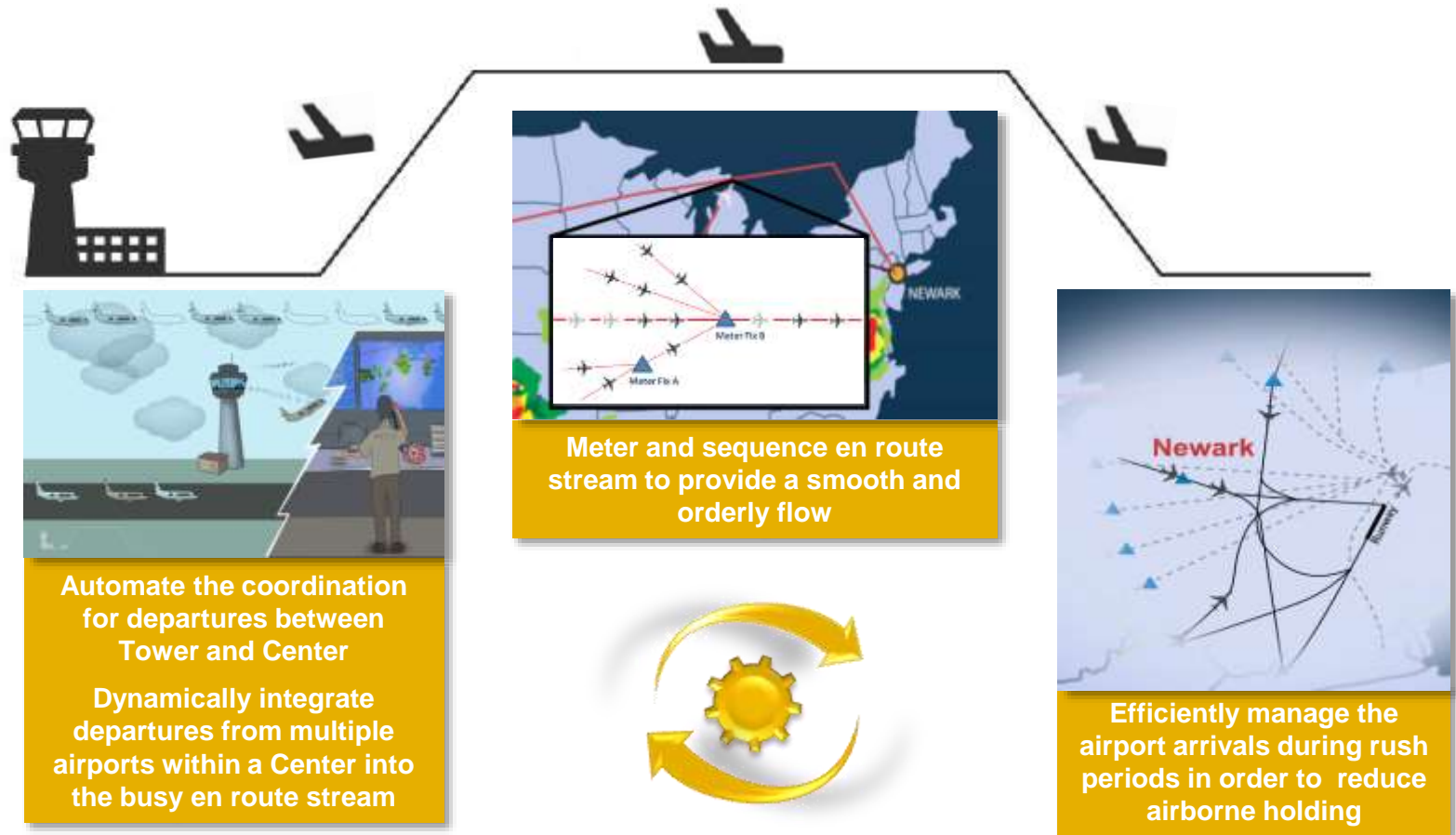
Decision support system for planning and mitigating demand-capacity imbalances in the NAS.



Time Based Flow Management (TBFM)

TBFM: Metering and Sequencing

TBFM utilizes available airport and airspace capacity more efficiently by metering and sequencing flights while avoiding unnecessary delay when complying with all operational constraints



Information Sharing

Publishing TBFM information to SWIM for subscription to both Internal and External Users

- TBFM publishes information such as:
 - Aircraft Information - Flight plan information, Estimated Time of Arrivals, Scheduled Time of Arrivals, etc.
 - Configuration Information - Arrival Airport Configuration, Acceptance Rates, etc.
 - Metering Status Information - TMA Metering Status, etc.
- Consumers:
 - Non-NAS consumers: Delta to start, followed by other airlines, Lincoln Labs, Volpe, etc.
 - Able to better predict arrival/departure times of aircraft
 - NAS Consumers – TFMS and TFDMM
 - Improve coordination between multiple FAA Systems to maximize efficiency

Information Sharing – Key Dates

- April 2014
 - ZTL started publishing data to SWIM; Volpe consuming.
- July 2014
 - MOA signed between FAA and Delta; Delta consuming.
- August 2014
 - TBFMS and TBFM data sharing demonstrated.
- April 2015
 - Filter STD Data for increased usability. But, Real-time usage of TBFM data broke.
- November 2015
 - Information Sharing turned on at all ARTCCs.
- November 2015
 - Follow up meeting with Industry.
- December 2015
 - TBFM-TFMS Information Sharing Enabled utilizing SWIM.



Terminal Flight Data Manager (TFDM)

TFDM: Surface Management and Electronic Flight Data

TFDM is an acquisition program with four components.

Electronic Flight Data

Integrated flight, surveillance and traffic management information in the terminal area



Surface CDM

Better management of surface demand through data exchange among stakeholders



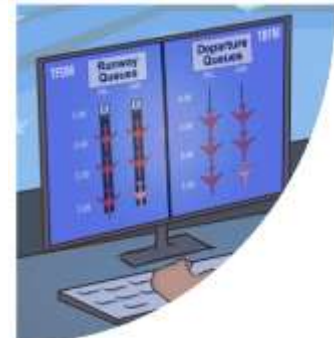
System Consolidation

Consolidation of tower displays and input devices



Surface TFM

Decision support capabilities for airport surface resource management



Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

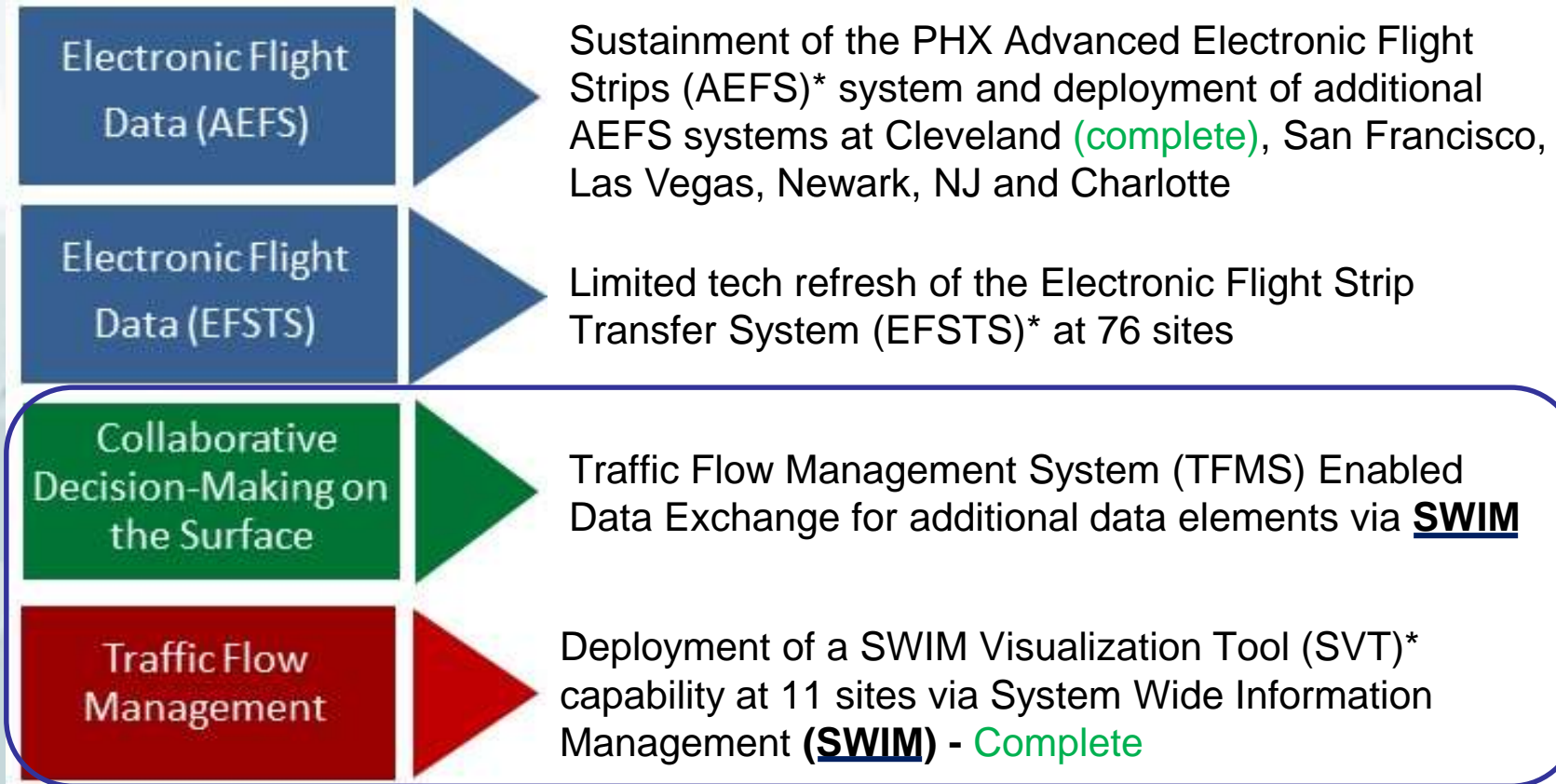
TFDM Interdependencies

Planned SWIM / TFDM Interfaces

- **Flight Operators and Flight Service Providers**
 - More Timely and Specific Information on Individual Flights from the operators including gate and estimated off block times
 - Schedule and Surface Metering Information from TFDM to operators
- **Time Based Flow Management (TBFM)**
 - Airport Specific Arrival Predications and Schedules
 - Call For Release Data Exchange
- **Traffic Flow Management System (TFMS)**
 - TFM Data Service
- **Flight Data Publication Service information (FDPS)**
- **ASDE-X/ASSC**
 - SWIM Terminal Data Distribution Service information for Surface Situational Awareness (SSA) via TFMS

Please note TFDM information in this briefing may be subject to change until the FAA's Final Investment Decision is complete.

TFDM Early Implementation



* After the In-Service Decision of the baselined system, the TFDM Program Office will replace AEFS, EFSTS, and the SVT capability with the TFDM equipment and capabilities.

Basic Surface Data Elements in TFMS Release 13

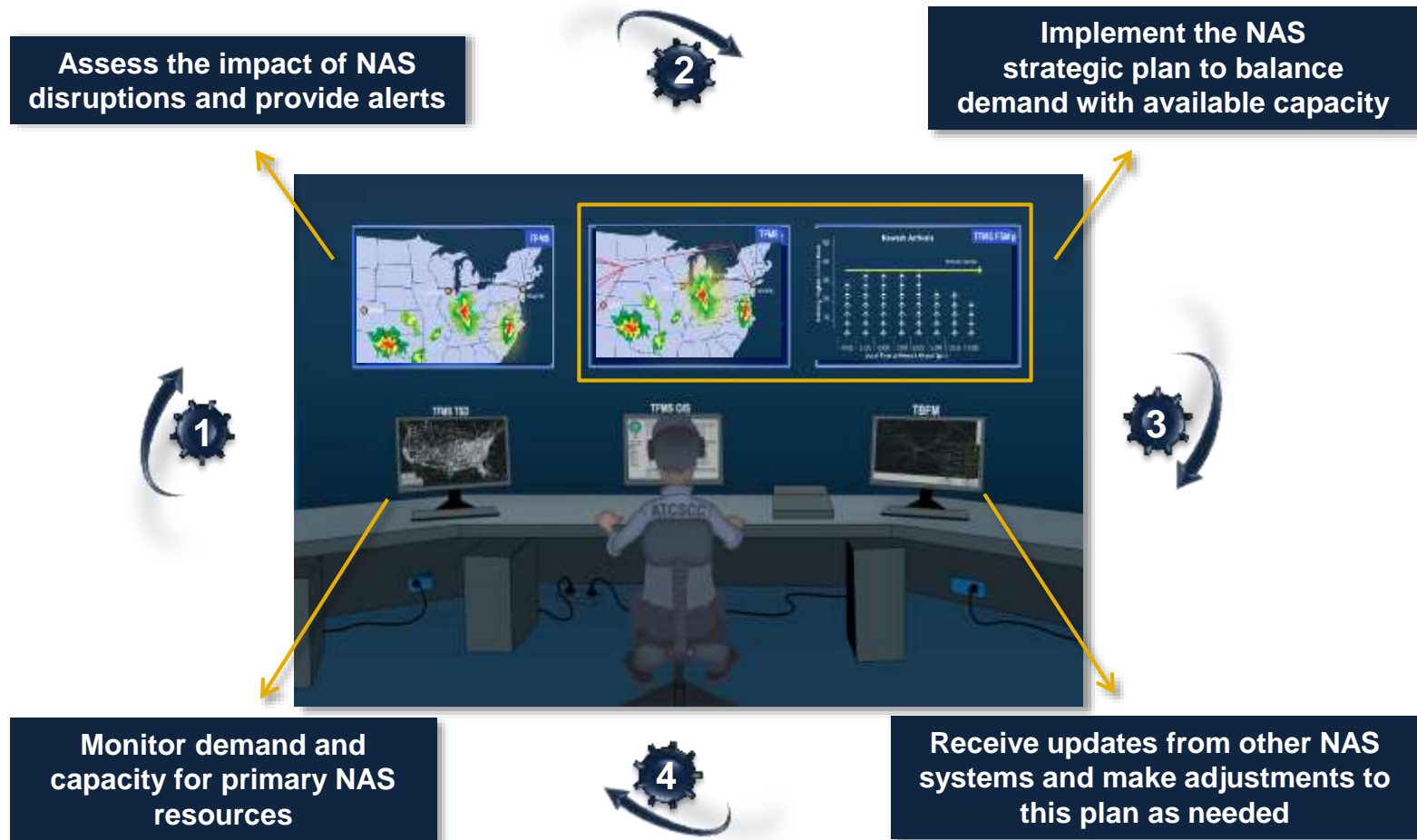
Flight Data Provided by Flight Operators

Data Element	Description
Actual Off-Block Time (AOBT)	The actual time at which a flight has sent a 'block out' message from the gate or parking location. This information will be used to help determine the accuracy of flight operators' Earliest Off Block Time (EOBT).
Actual Takeoff Time (ATOT)	The time at which a flight lifts off from the runway as reported by the CDM Participant via a CDM message. If the CDM participant sends more than one value, the most recently submitted time is contained in this field. Otherwise, the value is null. This time stops the DOT3 time for departing flights
Actual Landing Time (ALDT)	The Actual time the flight has landed on the runway. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions. This element is the DOT3 arriving aircraft time trigger.
Actual In-Block Time (AIBT)	The Actual time the flight has blocked in at the gate. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions for both gate and departure predictions on availability.
Aircraft Tail/Registration #	A unique, alphanumeric string that identifies a civil aircraft and consists of the Aircraft Nationality or Common Mark and an additional alphanumeric string assigned by the state of registry or common mark registering authority. "Aircraft Registration Mark" in FIXM Core.
Earliest Off-Block Time (EOBT)	Time when the flight operator plans for an aircraft to push back from its assigned gate. The system can forecast surface demand vs. capacity based on flight operator's best estimation of push back time. The fidelity of EOBT is required for proper surface predictions and process.
Flight Cancellation	Message that indicates a flight has been cancelled. Identifies a cancelled flight to ensure that resources are not engaged and/or fully utilized.
Flight Intent	The Flight Intent would be limited to Flight Operator plan to push back early during a DMP and hold in the AMA.
Gate Assignment	Airport Gate that is assigned to a flight. Gate information will lead to more accurate ramp transit time (RTT) calculations and therefore more accurate ETD.
Initial Off-Block Time (IOBT)	The initial off-block that a flight provided. Used to save the original Off-Block time of the flight. Useful for flight data matching.
Earliest Runway Time of Departure (ERTD)	The flight operator estimate of runway departure time not including any traffic management initiatives.



Traffic Flow Management System (TFMS)

TFMS: Focusing on efficiently improving the “greater NAS”



TFMS Data – Deployed November 2014

- TFMS publication service Traffic Flow Management Data “TFMData” via SWIM includes:
 - Flight Data: *Flight Plan Data, Departure & Arrival time notifications, Flight cancellations*
 - Flow Information: *TMLs, ATCSCC advisories, Restrictions, etc.*
- Current legacy feeds to be retired (by April 2016):
 - ASDI (Aircraft Situation Display to Industry)
 - TFMDI (TFM Data to Industry)
 - TFMDG (TFM Data to Government)
 - FTM Connect

TFMS Data Enhancements – April 2016 Release

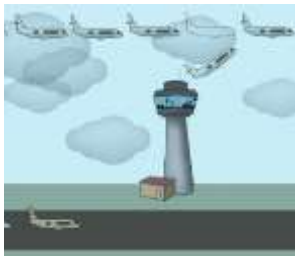
- Terminal Flight Data Manager (TFDM) Interface
 - Ingest select surface data elements for early implementation via SWIM
 - Improve departure modeling
 - Distribute new messages via TFM Data Feed (SWIM)
- International Data Provider (IDP) interface
 - Goal is to replace current interfaces using SWIM/NEMS message exchange

Client Starter Kit & Companion Guide

- FAA developing a TFMDData client starter kit and companion user guide.
 - Anyone approved for TFMDData will have access to the starter kit
 - Once approved for TFMDData access, contact Chris Burdick (Chris.Burdick@faa.gov)
- Starter kit provides
 - Instructions for building the client,
 - Installing and configuring the MySQL instance,
 - and deploying in a cloud
- Companion user guide, included in the starter kit, provides
 - Description of TFMDData elements
 - Additional setup/use instructions for starter kit
- First stage -subset of flow data available now; additional message types to be supported in subsequent weeks

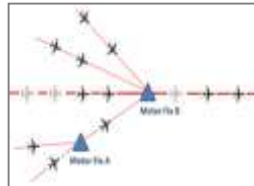
Integrated TFM: 3Ts working together utilizing SWIM

TBFM



TBFM efficiently merges departures from multiple airports within an ARTCC into the enroute stream.

TBFM



TBFM sequences and spaces the enroute stream and arrivals stream maximizing available capacity. More efficient arrivals improve the efficiency of departure operations as well.



TFMS



TFMS monitors NAS resources and implements a reroute and ground delay at Newark to balance demand with available capacity at an aggregate level; making the demand more manageable at local facilities and distributing the required delays equitably.

TFDM

With knowledge of surface conditions, TFDM automates the coordination of an opening in the enroute stream with TBFM for departing flights.



TFDM

Accounting for TBFM and TFMS restrictions, TFDM will provide a departure scheduler, departure metering, and other surface management tools to improve the efficiency of surface traffic flow management.



TFMS

TFMS receives updates from other NAS systems and makes tactical flight-by-flight adjustments as needed. A new reroute is available for this flight that avoids the weather.



Questions

